Remarks

In the current Office Action, the Examiner has rejected Claims 18, 19, 23 and 24 under 35 U.S.C. § 112, as being indefinite. The Examiner further rejected Claims 1-24 under 35 U.S.C. § 103(a), as being allegedly obvious in view of Shmoys, et al., "Approximation algorithms for facility location problems," 1997 Proceedings of the twenty-ninth annual ACM symposium on Theory of computing, El Paso, Texas, United States, pages 265-274(1-21)(hereinafter "Shmoys").

Applicant asserts that, in view of the foregoing amendments to the claims and the following remarks, the rejections under §§ 112 and 103(a) should be withdrawn.

I.   The requested claim amendments.

Applicant has amended independent claims 1 and 9 to require that the closest service provider branch location for each service receiver be identified by travel time between the service provider and receiver. As discussed below, this is a considerable and important difference between the amended claims and the algorithms disclosed in Shmoys. Claim 2 has been canceled because, in view of the amendments requested above, it is duplicative.

Applicant has amended claims 13 and 20 to correct a typographical error, namely, replacing the word "receives" with "receivers."

Applicant has further amended claims 18, 19, 23, and 24 to address the current rejections under 35 U.S.C. § 112 (discussed below).

II.   The requested amendments to the claims render the rejections under 35 U.S.C. § 112 moot.

The Examiner rejected claims 18, 19, 23 and 24 under 35 U.S.C. § 112 because the term "stop criterion," used in said claims, lacks sufficient antecedent basis.

With respect to claims 18 and 19, Applicant states that these claims depend from claim 15, which depends from claim 14, which depends from claim 13, which depends from claim 12. Likewise, with respect to claims 23 and 24, Applicant states that these claims depend from claim 20, which depends from claim 14, which depends from claim 13, which depends from claim 12.

Applicant notes that claim 12 recites the step of "selecting a calculation stop criterion." Accordingly, Applicant believes that "stop criterion" in claims 18, 19, 23 and 24 has proper antecedent basis. For the purpose of clarifying this limitation, however, Applicant has amended these claims to recite "calculation stop criterion," as recited in independent claim 12 - from which claims 18, 19, 23 and 24 indirectly depend.

In view of the foregoing, Applicant respectfully requests that the rejections under § 112 be withdrawn.

III. The rejections under 35 U.S.C. § 103(a) should also be withdrawn.

The primary reference the Examiner relies upon in rejecting the originally-filed claims is Shmoys. Applicant respectfully states that the Examiner's interpretation of Shmoys, and his comparison of its disclosure to the pending claims, is wrong. Indeed, many of the conclusions reached by the Examiner rest on faulty reasoning and a misinterpretation of Shmoys and the claimed invention.

A. Considerable and non-obvious differences exist between amended claims 1-11 and 13-24 and the disclosure of Shmoys.

There are several important and non-obvious differences between Shmoys and the claimed invention. Importantly, these differences (which are relevant to amended claims 1-11 and 13-24) are cumulative and, collectively, render the claimed invention completely different than the algorithms disclosed in Shmoys. As such, the current

rejections under § 103(a) should be withdrawn. These differences between amended claims 1-11 and 13-24 and Shmoys will be discussed further below.

1.   The present Office Action incorrectly equates "a measure of service receiver value" with the desire to identify low cost service receivers (vis-à-vis merely calculating the distance, *i.e.*, the geometric distance, between service providers and receivers). The "service receiver value" recited in the pending claims is not related to a measure of the cost associated with a service receiver, but rather the <u>value</u> of a particular service receiver to a service provider. The value may take into account, for example, the "headcount" of customers within a defined area; economic information, consumer behavior and financial evaluations; demographic information; income levels; and the like. *See* Para. [0036] of the present Application. In other words, the "service receiver value" recited in the pending claims is relevant to and based upon the amount of revenue that a service receiver may, potentially, provide to a service provider - and is not merely the one-dimensional cost to a particular service provider as contemplated in Shmoys.

2.   The present Office Action equates "distance" (used in Shmoys) with "travel time" (used in the present invention). *See, e.g.,* amended claim 1, step (e). The use of "travel time" in the context of the present invention is completely different than mere "distance" - or, more particularly, the mere geometric distance contemplated in Shmoys. This is an important difference between the claimed invention and Shmoys. For example, when "determining which ... service provider branch locations is the closest service provider branch location for each ... [of the] service receivers," the outcome may be very different if "travel time" (a more complex metric) is considered instead of mere "distance" or geometric distance, which is a basic calculation of the

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distance between two points (such distance is often referred to *"as the crow flies"*). Of course, the Examiner should appreciate that mere "distance" does not take into account the roads that a traveler may be forced to take. In other words, the basic distance, or geometric distance, contemplated in Shmoys would represent the distance between two geographical locations (*"as the crow flies"*), without considering the total distance that a person may actually be required to travel in view of road directions, road turns, road availability, etc.

Moreover, unlike calculating "travel time" (as in the present invention), the use of mere geometric distance will also fail to consider the accessibility of existing roads, the average driving speed of roads, intervening geographical barriers (*e.g.*, road construction, rivers, etc.), whereas "travel time" will preferably incorporate such factors (rendering "travel time" a much more useful, albeit more complicated, metric to employ in the context of the present invention).

In determining, for example, where to place branch locations, the "travel time" of a consumer will be considerably more relevant than merely "geometric distance." The "travel time" may be affected by any of the factors referenced above, such as the accessibility of roads, the average driving speed of roads, and intervening geographical barriers. As such, if the mere "geometric distance" (used in Shmoys) were considered in carrying out the methods of the present invention, the invention would likely yield inaccurate and undesirable results. For example, if a first person is slightly closer in distance to a hospital than a second person, if the first person must take a long, detoured route to the hospital (perhaps due to a closed road), the first person's total travel time

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may exceed that of the second person's travel time. The present invention would take this factor into account, whereas the algorithms of Shmoys would not.

The use and consideration of "travel time" is an important difference between the claimed methods and the algorithms disclosed in Shmoys.

3.   On Page 5 of the present Office Action, the Examiner states that "Shmoy notes on page 2 para 2 that the analysis of assignment of service receivers to locations can be made using probabilistic analysis - [and that] this suggests determining a probability that a receiver will use the closest branch location." Importantly, however, to the extent that Shmoys discloses using probabilistic analysis (albeit only making passing references to the same), it seems to disclose using "probabilistic analysis" instead or in replacement of "distance" (which, as described above, is wholly inferior to using "travel time" in this context).

In sharp contrast, the present invention is not using probabilistic analysis for, *e.g.*, placing branch locations in replacement of determining which service provider branch location is the closest by travel time for each of the service receivers. Rather, the present invention requires the use of both factors, namely, (a) determining which service provider branch location is the closest by travel time for each of the service receivers and (b) determining a probability that each of the service receivers will utilize the closest service provider branch location.

Accordingly, in this regard, Shmoys actually seems to *teach away* from the present invention. That is, Shmoys seems to suggest replacing its "distance" analysis with probabilistic analysis, whereas the present invention calls for the use of its "travel time" analysis in combination with probabilistic analysis (*i.e.*, to use probabilistic

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analysis to adjust "travel time" variables). *See, e.g.*, independent claims 1 and 9, and dependent claim 13 (from which claims 14-24 depend). Again, this is a considerable difference. *KSR v. Teleflex*, 127 S.Ct. 1727 (2007) ("when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious.").

4. Applicant wishes to emphasize that all three of the above differences between Shmoys and the claimed invention apply to amended claims 1-11 and 13-24. As such, taken as a whole, these claims should not be considered obvious derivations over the algorithms disclosed in Shmoys. Furthermore, it is a remarkable stretch to argue that it "would have been obvious to try" modifying the plurality of algorithms and generalized disclosure of Shmoys into the claimed invention. (Office Action, pp. 3-4).

Applicant appreciates the commentary provided in the *KSR* decision, referring to an alleged invention (new combination of known elements) being "obvious to try." However, the notion of something being "obvious to try" (as alluded to in the present Office Action on page 4 thereof) must be anchored by facts. Indeed, it is still the case that a rejection under § 103(a) must be based on facts, and not mere speculation as to how one of ordinary skill in the art may allegedly modify and supplement a generalized disclosure like Shmoys. *Ex parte Saceman*, 27 USPQ2d 1472, 1474 (BPAI 1993). When a conclusion of obviousness is not based on facts, it cannot stand. *Ex parte Porter*, 25 USPQ2d 1144, 1147 (BPAI 1992).

As described above, not only does the prior art fail to disclose all of the limitations of amended claims 1-11 and 13-24, namely the three different limitations outlined in Sections III.A.1, 2, and 3 above, Shmoys actually seems to *teach away* from

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these claims, insofar as it seems to suggest replacing its "distance" analysis with probabilistic analysis, whereas the present invention calls for the use of its "travel time" analysis in combination with probabilistic analysis. *See, e.g.*, independent claims 1 and 9, and dependent claim 13 (from which claims 14-24 depend).

In view of the foregoing, Applicant respectfully requests that the rejections of claims 1-11 and 13-24 under § 103(a) be withdrawn.

B. **Claims 4-8, 10, 11, and 13-24 require the step of determining a value for each of the service provider branch locations, which is not disclosed in Shmoys.**

Claims 4, 10, and 13 (and the claims that depend therefrom) require the step of determining a value for each service provider branch location. This is not disclosed in Shmoys, which merely teaches deriving *cost minimizations* associated with a facility using the algorithms disclosed therein. The present invention is not concerned with the cost of a branch location. Rather, the present invention (and the amended claims) focuses on the upside value for each service provider branch location, which is impacted by the revenues to be offered by potential service receivers by examining, for example, the "headcount" of customers within a defined area, economic information, consumer behavior and financial evaluations, demographic information, income levels, and the like. *See* Para. [0036]. Such considerations have nothing to do with the mere cost of a facility.

In addition, referring to claim 5 of the present application, Shmoys merely discloses, according to the Examiner's interpretation, a "cost minimization algorithm sums for all the facilities that the aggregate demand from the clients (i.e. the service receivers) will be serviced at various locations ..." (Office Action, p.7). The approach taken by the present invention, however, is entirely different and indeed superior. By

multiplying the probability (based on travel time - not mere geometric distance) that a service receiver will visit a branch with the value (not cost) assigned to a service receiver, and then summing this product for each service receiver determined to be closest (in travel time) to the applicable service provider branch location, a more realistic and accurate value for each service provider branch location is derived. This is a major difference between certain embodiments of the present invention (namely, claims 5, 6, 8, 11, and 15-19), and Shmoys. Indeed, Shmoys completely ignores the value of service receivers and, furthermore, is completely void of any disclosure related to the adjustment of such value based on the probability that a service receiver will utilize a particular service provider branch location.

Accordingly, for the foregoing reasons, in addition to the reasons provided in Section III.A above, claims 4-8, 10, 11, and 13-24 should be allowed.

C. The Examiner completely misinterprets the term "network reach" in claim 7.

In support of rejecting claim 7, the Examiner states that, on "[p]age 3 under section 2, the definition of 'n' network facilities defines network reach." (Office Action, p.8). However, in reviewing the part of Shmoys that the Examiner cites, it seems that Shmoys defines network reach ('n') as the network's facilities (or wherever there is a service provider). This definition is completely different than how the term "network reach" is being used in the present application.

The term "network reach" in the present application is used to refer to, for example, the "number of individuals being serviced" within an area. *See, e.g.*, Para. [0043]. Moreover, the "network reach" value is adjusted by, for example, the service receiver value and the probability that a service receiver will visit a particular branch

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location. *See, e.g.*, Para. [0053]-[0054]. The "network reach" is not merely the variable

('n') disclosed in Shmoys, which seemingly is correlated with just the network facilities

themselves.

The present Office Action fails to identify a location in Shmoys where the

limitation of claim 7 is disclosed. Accordingly, for the foregoing reasons, in addition to

the reasons provided in Sections III.A and B above, claim 7 should be allowed.

D.   The present Office Action incorrectly analogizes a fractional mutational / linear relaxation approach to a genetic algorithm. Claims 12-24 should be allowed.

The present Office Action incorrectly equates a fractional mutational / linear

relaxation approach to a genetic algorithm. This is a completely inappropriate analogy.

The unsuitability of a fractional mutational / linear relaxation approach, versus using a

genetic algorithm, is apparent when considering the fact that the present invention utilizes

the "travel time" between a service receiver and provider (instead of merely "geometric

distance" as in Shmoys).

By considering only geometric distance (and not travel time), Shmoys is able to

employ a fractional mutational / linear relaxation approach to conduct the purely

academic exercise of optimizing facility locations. However, as discussed above, the

present invention takes into account "travel time" and, therefore, numerous factors that

may impact the duration of time that may be required for a service receiver to travel to a

service provider (such as, for example, the accessibility of roads, the average driving

speed of roads, intervening geographical barriers (*e.g.*, road construction, rivers, etc.)).

Because analyzing "travel time" will introduce a sort of chaotic solution space

(*i.e.*, a small change (*e.g.*, a closed road) having a significant impact on the result (*e.g.*, on
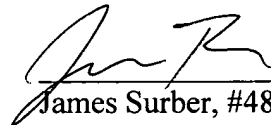
travel time)), a simple approach such as Shmoys' linear relaxation algorithm would not work. Rather, the present invention provides that a more powerful genetic algorithm is needed to carryout the steps recited in the amended claims. The Examiner's reliance upon Shmoys in this regard is entirely misplaced. The Declaration Under 37 C.F.R. § 132, filed herewith as **Exhibit A**, further describes the important differences between Shmoys' fractional mutational / linear relaxation approach and a genetic algorithm (used in the present invention) in more detail.

Accordingly, for the foregoing reasons, in addition to the reasons provided in Sections III.A and B (for claims 13-24), claims 12-24 should be allowed.

IV. Conclusion

In view of the Amendments to the Claims, Applicant respectfully requests that the current rejections under §§ 112 and 103(a) be withdrawn.
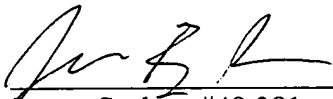
Respectfully Submitted,

James Surber, #48,381

Extension of Time Under 37 C.F.R. § 1.136(a)

Please grant a one-month extension of time for responding to the Office Action mailed February 13, 2008. With the requested extension, the deadline for a response will be June 13, 2008. A check is enclosed herewith for the Extension of Time fee under 37 C.F.R. § 1.136(a).

Respectfully Submitted,

James Surber, #48,381